

Claims

1. A current selective D flip-flop circuit on a chip for receiving at least two currents and performing biasing current selection, comprising:

a D flip-flop;

a first receiving means having a first receiving means input terminal for receiving one of at least two currents and having a first receiving means output terminal for providing a first current, the first current being dependent on the one of at least two currents;

a second receiving means having a second receiving means input terminal for receiving another of the at least two currents and having a second receiving means output terminal for providing the second current, the second current being dependent on the another of the at least two currents;

a summing node to which a first receiving means output terminal is connected to the second receiving means output terminal for summing the first current and the second current to obtain a summed current therefrom; and

a current comparator having a current comparator input terminal connected to the summing node, wherein the current comparator is coupled to the second receiving means for comparing the summed current with the second current to thereby select one of the first current and the second current as an output current for biasing the D flip-flop, and the one of the at least two current is receivable from an on-chip biasing current source and the other of the one of the at least two current is receivable from a constant biasing source.

2. The current selector circuit of claim 1, wherein the current selector circuit is coupled to the D flip-flop through a current multiplier, wherein the current multiplier comprises:

a current mirror source being coupled to the current selector circuit; and

a multiple-output current mirror being coupled to the current mirror source and the D flip-flop.

3. The current selector circuit of claim 1, wherein the first receiving means comprises a first current mirror.

4. The biasing current selector circuit of claim 3, the first current mirror comprising at least two PMOS transistors.
5. The current selector circuit of claim 1, wherein the second receiving means comprises a second current mirror.
6. The current selector circuit of claim 5, the second current mirror comprising at least two NMOS transistors, and the second receiving means output terminal being connected to the first receiving means output terminal.
7. The current selector circuit of claim 1, the current comparator comprising:
 - a third current mirror connected to the drain of a transistor to form an output node, wherein the output node is connected to an output terminal for providing the output current to the D flip-flop through the current multiplier.
8. The biasing current selector circuit of claim 7, the third current mirror comprising:
 - a current comparator input terminal connected to the summing node; and
 - at least two NMOS transistors.
9. The current selector circuit of claim 1, wherein a voltage supply is connected to the first current mirror.
10. The current selector circuit of claim 1, wherein the second receiving means and the current comparator is connected to ground.
11. The current selector circuit of claim 1, the output current being selected by the current comparator from one of the first current and second current having a larger current magnitude.
12. A method for performing biasing current selection in a current selective D flip-flop circuit, the method comprising the steps of:

applying a first and a second current to a first receiving means input terminal of a first receiving means and a second current to a second receiving means input terminal of a second receiving means;

providing the first current from a first receiving means output terminal of the first receiving means;

providing the second current from a second receiving means output terminal of the second receiving means;

summing the first current and the second current to produce a summed current at a summing node;

comparing the summed current with the second current by a current comparator; and

selecting one of the first current and the second current as an output current by the current comparator in response to the summed current and the second current being compared.

13. The method of claim 12, the step of providing a first current from a first receiving means output terminal comprising the step of providing the first current from the first receiving means having at least two PMOS transistors.

14. The method of claim 12, the step of providing a second current from a second receiving means output terminal comprising the step of providing the second current from the second receiving means output terminal with the second receiving means output terminal being connected to the first receiving means output terminal.

15. The method of claim 12, the step of comparing the summed current with the second current by a current comparator comprising the step of:

providing the current comparator having a third current mirror connected to the drain of a transistor to form an output node, wherein the output node is connected to an output terminal for providing the output current thereat to the D flip-flop.

16. The method of claim 15, the step of providing the current comparator having a third current mirror comprising the steps of:

providing the current comparator having a third current mirror comprising:

a current comparator input terminal connected to the summing node for receiving the summed current thereat; and

at least two NMOS transistors.

17. The method of claim 12, the step of providing the first current from a first receiving means output terminal comprising the step of:

providing the first receiving means with a voltage supply connected thereto.

18. The method of claim 12, the step of providing the second current from a second receiving means output terminal comprising the step of:

providing the second receiving means and the current comparator with a connection to ground.

19. The method of claim 12, the step of comparing the summed current with the second current by a current comparator comprising the step of:

comparing the current magnitude of each of the summed current and the second current.

20. The method of claim 19, the step of selecting one of the first current and the second current as an output current comprising the step of:

selecting one of the first current and second current having a larger current magnitude.

21. A current selective D flip-flop circuit capable of performing biasing current selection, the current selective D flip-flop circuit comprising:

a D flip-flop;

a current selector circuit couplable to the D flip-flop; and

a current multiplier;

wherein the current selector circuit is coupled to the D flip-flop through the current multiplier.

22. The current selective D flip-flop circuit of claim 21, wherein the current multiplier comprises:

a current mirror source being coupled to the current selector circuit; and
a multiple-output current mirror being coupled to the current mirror source and the D flip-flop.